

FIG. 1



Input: $|\chi\rangle, |L_\tau(\chi)\rangle = |0\rangle, |w\rangle = |0_{\lceil \log n \rceil}\rangle$

```
1:  for  $i = 1$  to  $n$  do
2:    if  $(|\chi_i\rangle = |1\rangle)$  then
3:       $|w\rangle \leftarrow |w + 1\rangle$ 
4:    endif
5:  endfor

6:  if  $(|w| \geq |\tau|)$  then
7:     $|L_\tau(\chi)\rangle \leftarrow |L_\tau(\chi) \oplus 1\rangle$ 
8:  endif

9:  for  $i = n$  to  $1$  do
10:   if  $(|\chi_i\rangle = |1\rangle)$  then
11:      $|w\rangle \leftarrow |w - 1\rangle$ 
12:   endif
13: endfor
```

Output: $|\chi\rangle, |L_\tau(\chi)\rangle, |w\rangle = |0_{\lceil \log n \rceil}\rangle$

FIG. 2

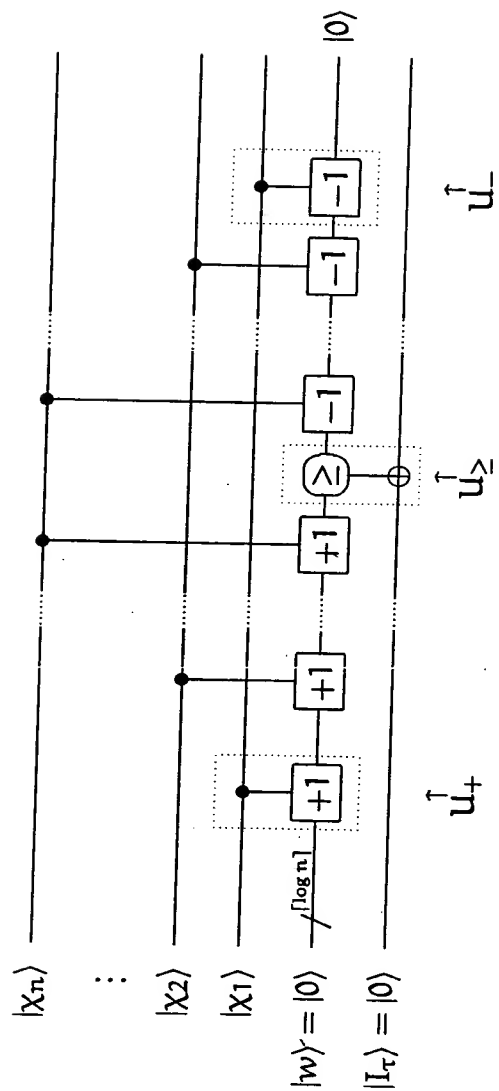
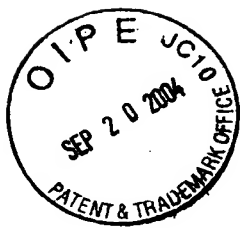


FIG. 3

Input: $|A\rangle, |B\rangle, |R\rangle, i, |T\rangle = |0_{iq}\rangle$

- 1: $|R\rangle \leftrightarrow |T_{[(i-1)q+1, iq]}\rangle$
- 2: for $j = (i-1)q$ to 1 do
- 3: if $(|A_{[j, j]}\rangle = |1\rangle)$ then
- 4: $|T\rangle \leftarrow |T + B2^{-j}\rangle$
- 5: endif
- 6: if $(|T\rangle \geq |B2^{-j}\rangle)$ then
- 7: $|A_{[j, j]}\rangle \leftarrow |A_{[j, j]} \oplus 1\rangle$
- 8: endif
- 9: $|T_{[iq]}\rangle \leftrightarrow |A_{[iq]}\rangle$
- 10: endfor

Output: $|A\rangle \leftarrow |AB + 2^{-(i-1)q-1}R\rangle,$
 $|R\rangle = |0_q\rangle, |T\rangle = |0_{iq}\rangle$

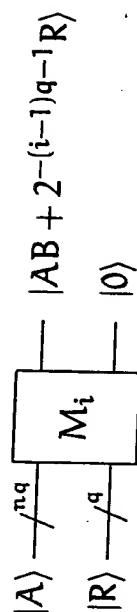


FIG. 4

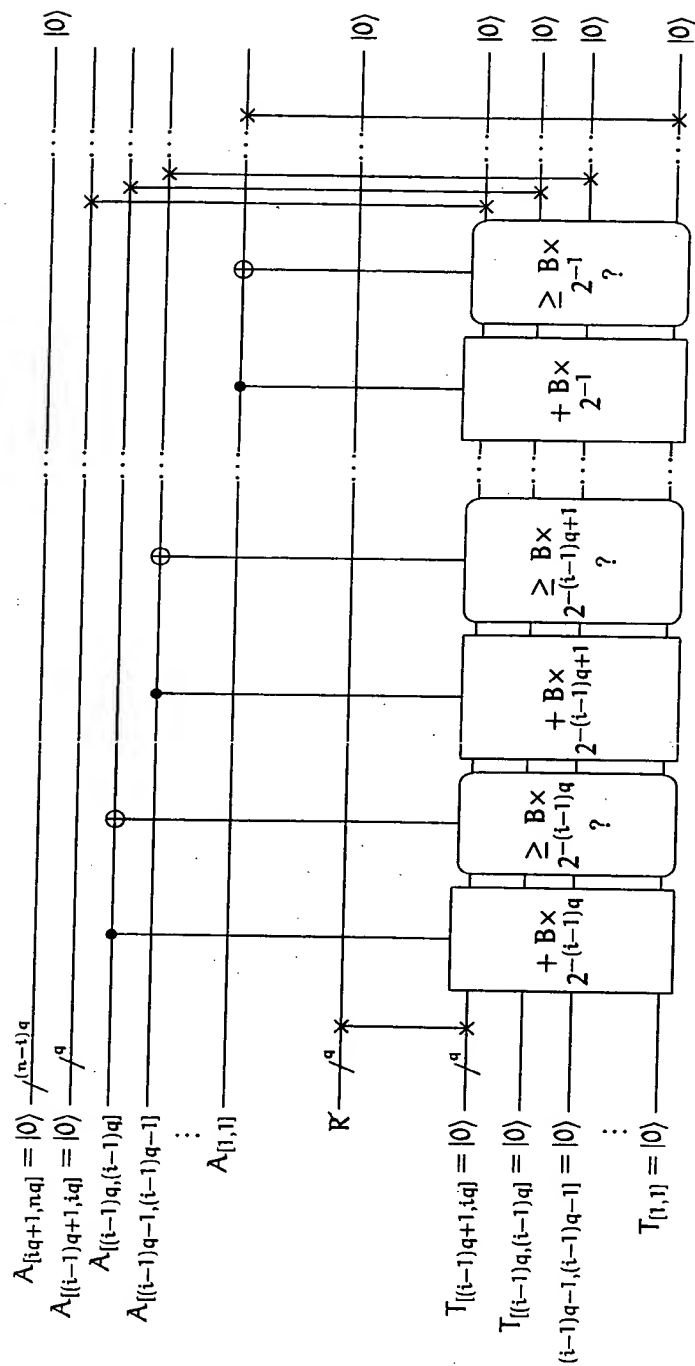


FIG. 5

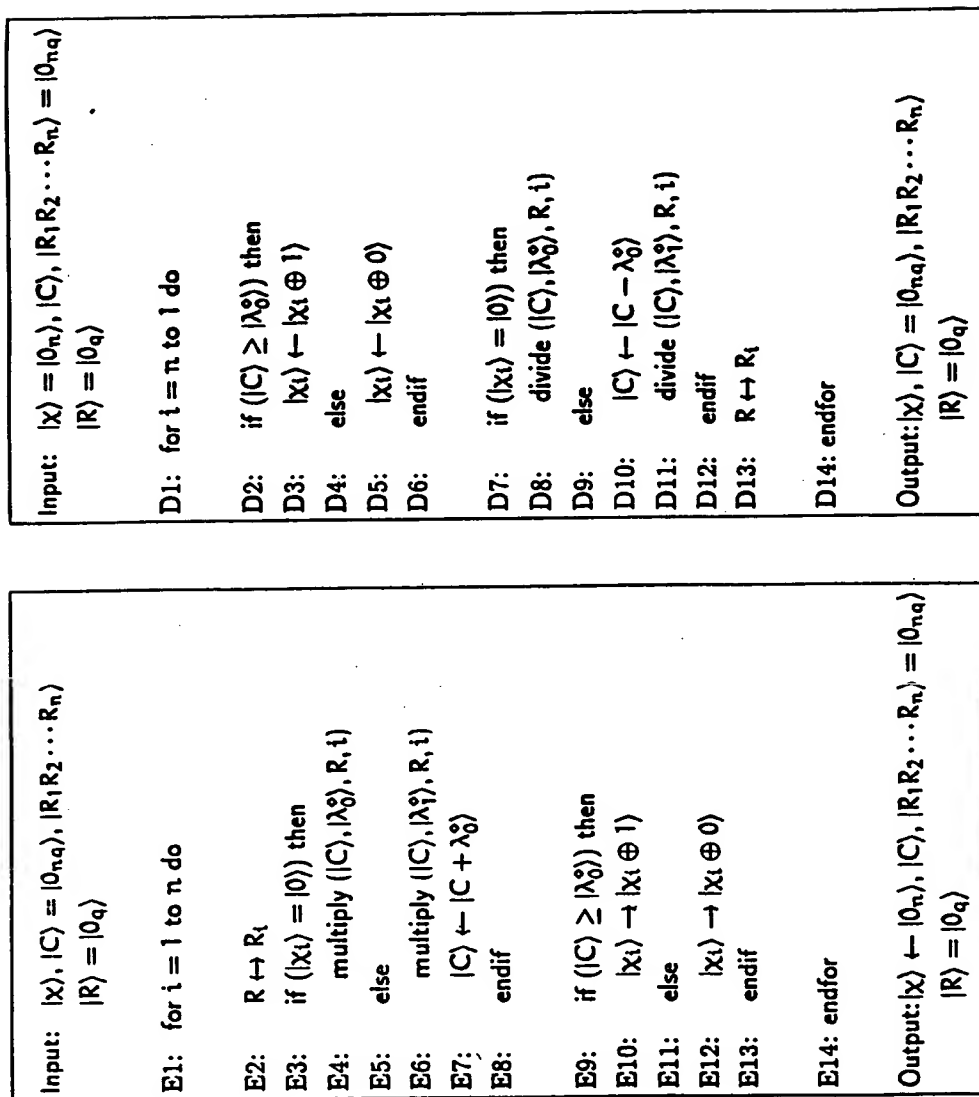


FIG. 6

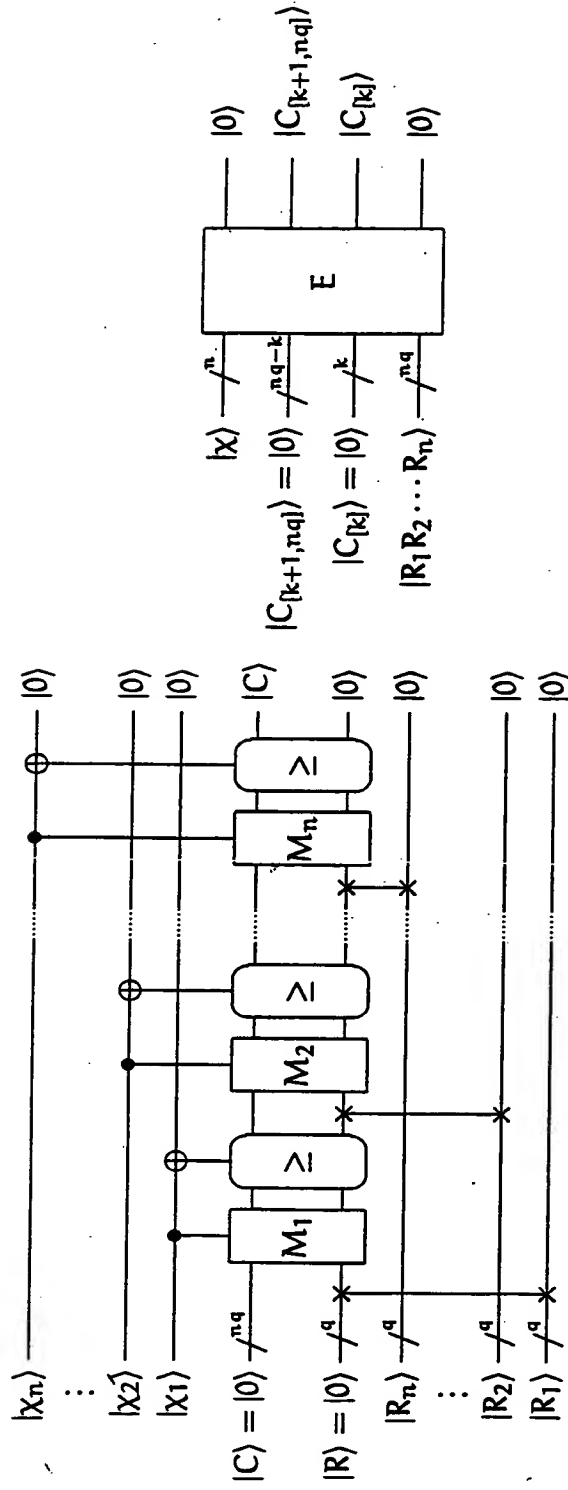
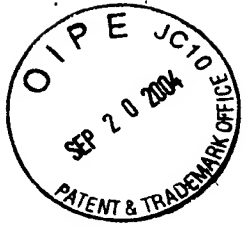


FIG. 7

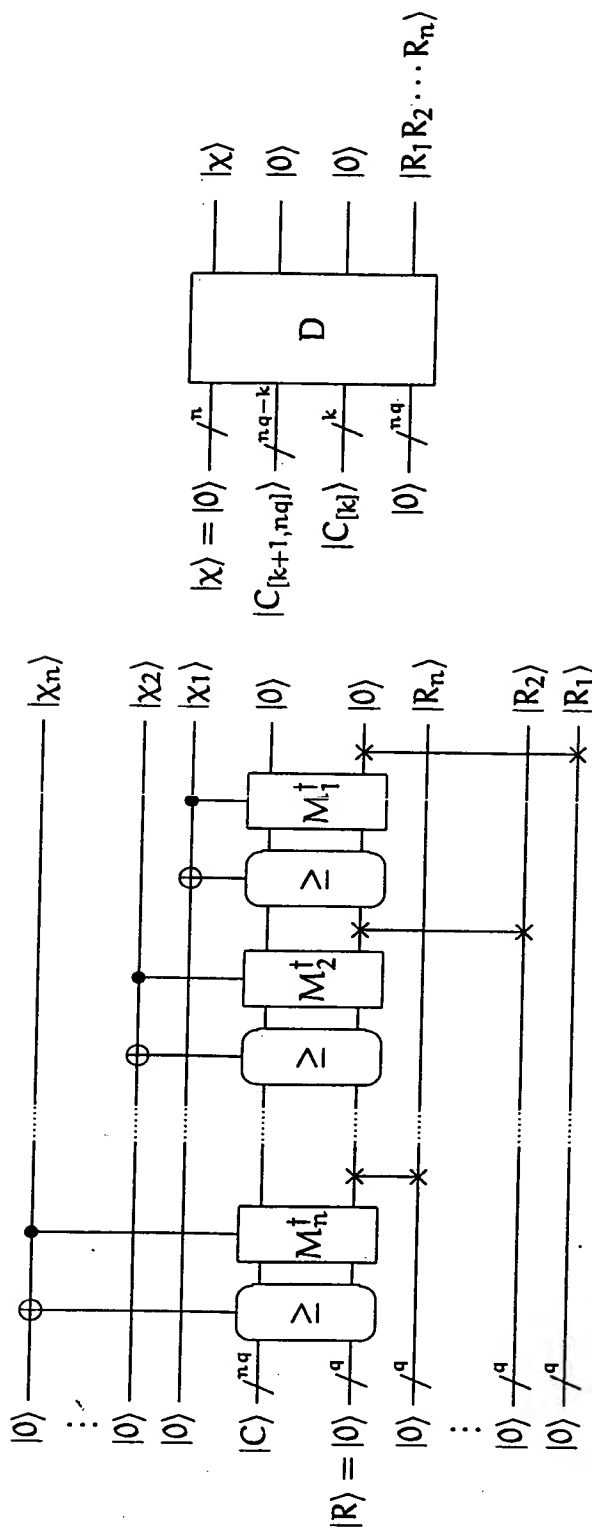


FIG. 8

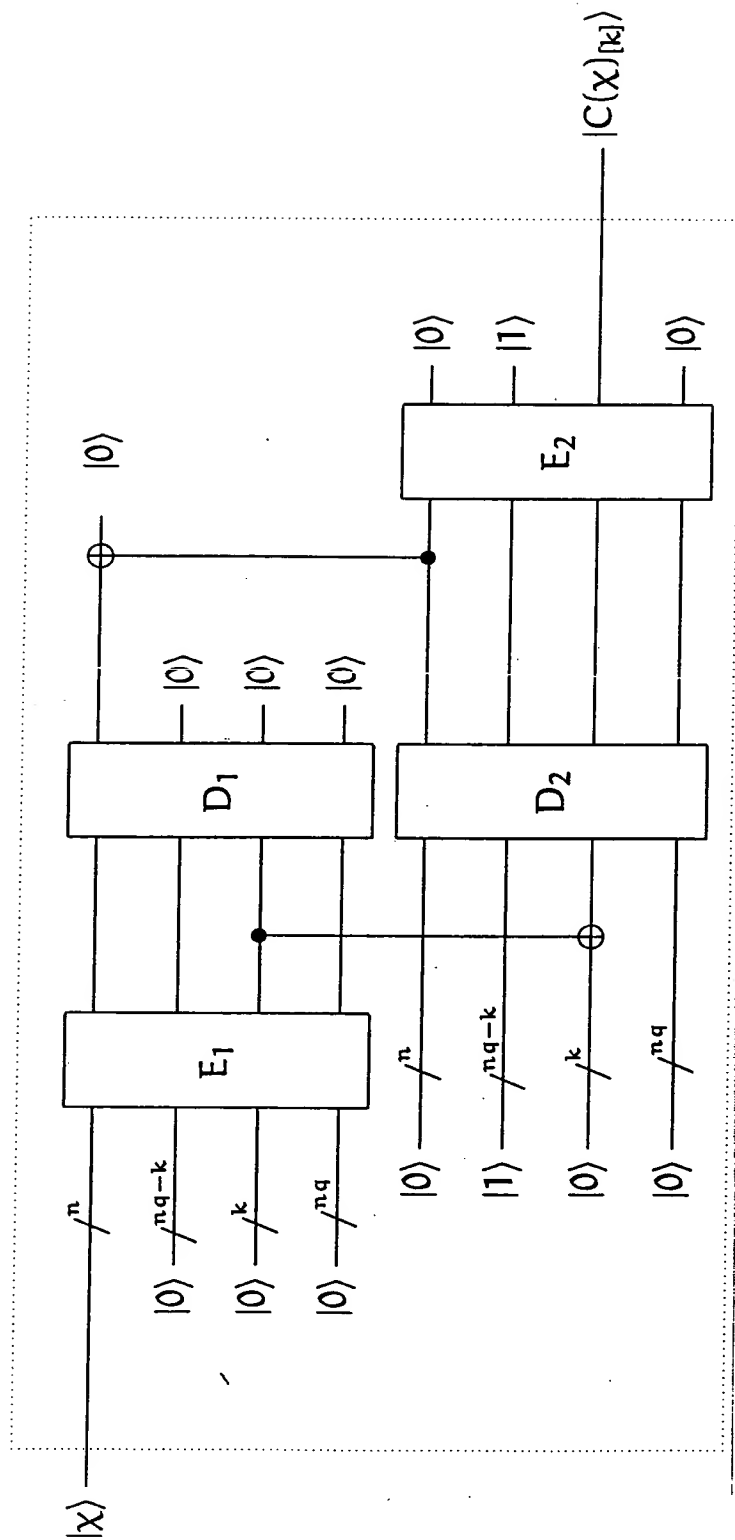


FIG. 9

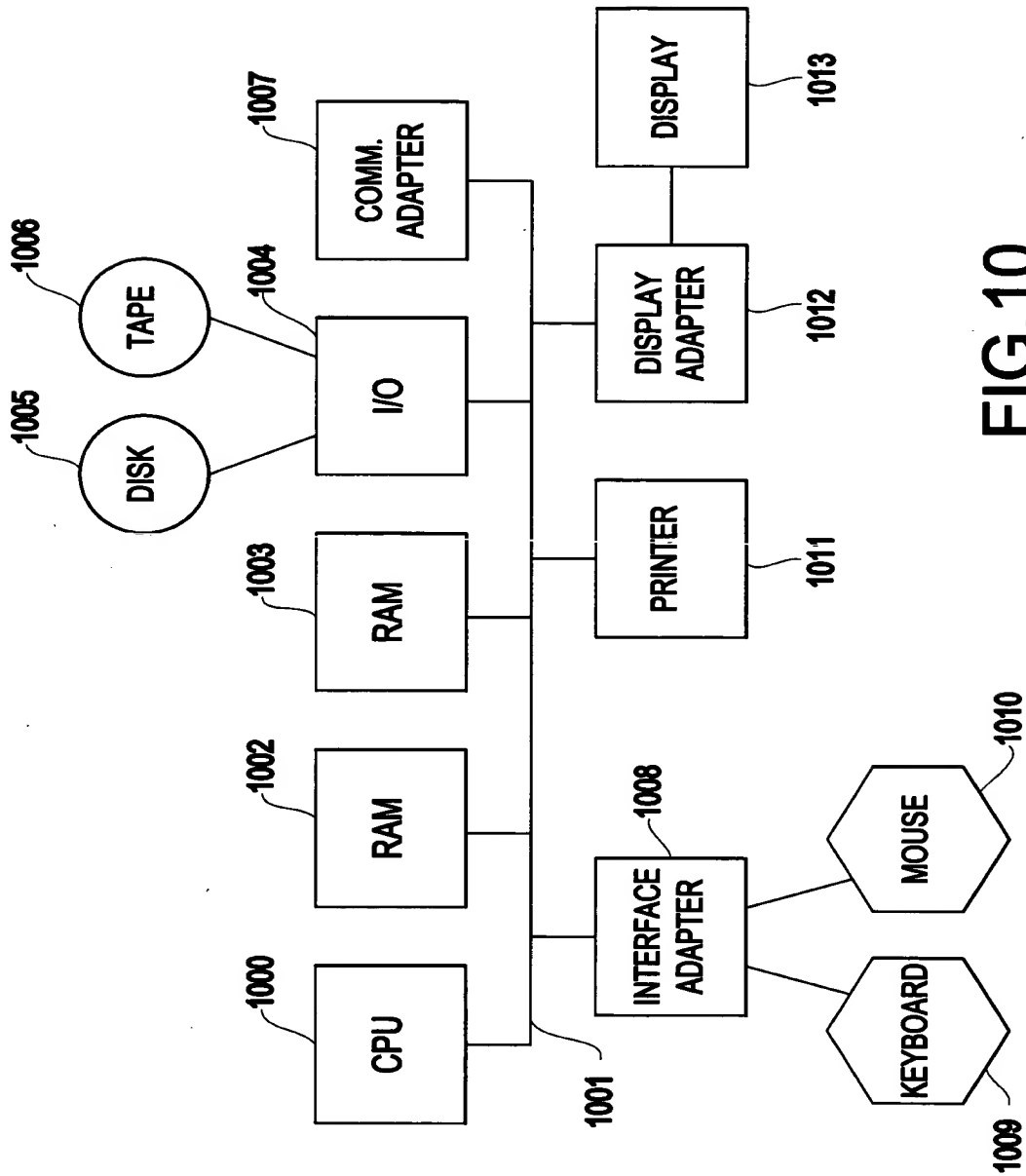


FIG.10